Multiply Warped Products: Generalized Kasner Space-times

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Abstract

We will study expressions that relate the Ricci (respectively, scalar) curvature of a multiply warped product with the Ricci (respectively, scalar) curvatures of its base and fibers as well as warping functions. Then we will introduce and consider a kind of generalization of Kasner space-times called as the generalized Kasner space-time which has the metric of the form

$$\mathrm{d}s^2 = -\mathrm{d}t^2 + \sum_{i=1}^{k} \varphi^{2p_i} \mathrm{d}x_i^2. \tag{1}$$

Moreover, we state necessary and sufficient conditions for a multiply generalized Robertson-Walker space-time to be Einstein or to have constant scalar curvature. These conditions allow us to classify possible Einstein (respectively with constant scalar curvature) generalized Kasner space-times of dimension 4.

[1]The talk will be presented by the second author (Bülent Ünal)